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TRIFURCULA SILVIAE VAN NIEUKERKEN: BIOLOGY AND NEW RECORDS (LEPIDOPTERA: NEPTICULIDAE)

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Trifurcula silviae van Nieukerken, 1990, previously known only from the French Alps only has been discovered in eastern Latvia, where stem-mines and larvae have been discovered on *Onobrychis arenaria*. New records are also given for the Italian and French Alps and Spain.

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Key words. – Nepticulidae, Latvia, disjunct distribution, stem-mines, biology, new records.

Trifurcula silviae van Nieukerken, 1990 was described after a small number of specimens from Southeastern France. It was found at relatively low and warm localities in the southern Alps up to high alpine localities (1800 m). Although the biology was unknown, its relationships in the *Trifurcula subnitidella* group and its occurrence in meadows without trees or shrubs indicated that it was, most likely, feeding on a leguminous herb, with *Anthyllis*, *Lotus* and *Onobrychis* as suggested possibilities (Van Nieukerken 1990). After visiting several of its localities, the senior author had a strong suspicion that the last plant genus was the most likely candidate, since the species *Onobrychis montana* DC. occurred in all localities, often in large numbers.

In the area near Šķaune, eastern Latvia, the third author discovered an unknown *Trifurcula* when sweeping plants of *Onobrychis arenaria* (Kit.) DC in 1985. This was identified by R. Puplesis as *Trifurcula subnitidella* (Duponchel) (at that time the only known species in this group) and published under its junior synonym *T. griseella* Wolff by Savenkov (1989, see also Savenkov 1994). Later the three junior authors discovered more specimens of this species and, unhappy with the original identification, turned to the senior author for an identification. In August 1994 they finally discovered empty and ten-

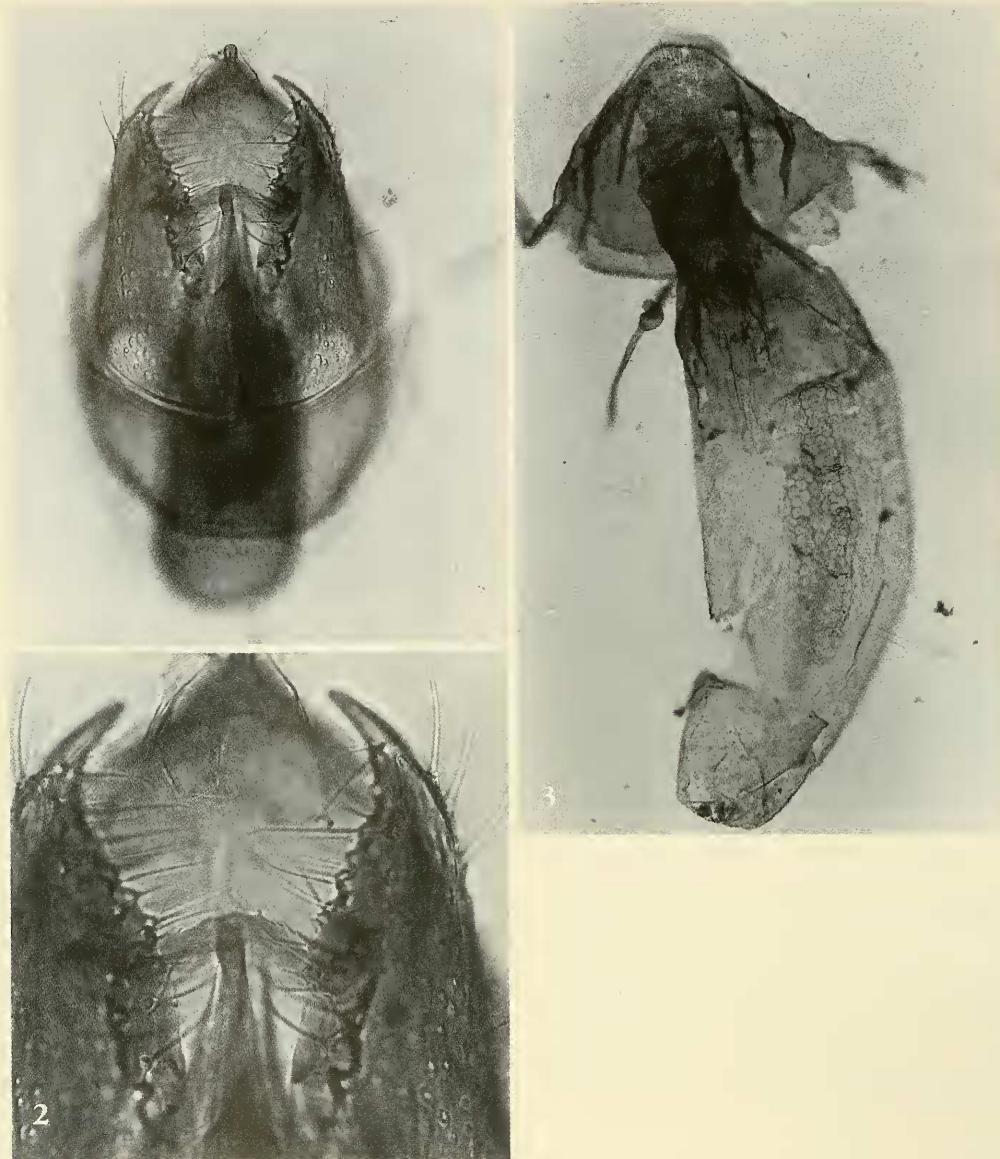
anted stem-mines of a nepticulid in the forementioned plant.

Although the locality is far apart from the area where the species was known, the senior author immediately considered it most likely to be *T. silviae*, which he could confirm after studying some specimens. The mines and larvae were also considered to belong to this species, which is now confirmed by the first emerging adults.

Also in 1994 the species was discovered in Spain by A. and Z. Laštívka and some unidentified Nepticulidae from G. Bassi contained the first Italian specimen, confirming a larger distribution than hitherto known. Since the original description was published, two more French specimens were found amongst unidentified material. The species is recorded for the first time from the area dealt with by Van Nieukerken & Johansson (1990) and by Puplesis (1994), we therefore provide a diagnosis and illustrations as an addition to these works.

Trifurcula (Trifurcula) silviae Van Nieukerken

Trifurcula silviae van Nieukerken, 1990: 230. Holotype ♂: France, 1 km NW Ceillac (Htes Alpes), 1800 m, 24.vii.1987, van Nieukerken & Richter (National Museum of Natural History, Leiden, RMNH) [examined]



Figs. 1-3. *Trifurcula silviae*, Latvia, Šķaune area. – 1, Male genitalia, slide EJvN 2833; 2, Idem, detail gnathos; 3, Female genitalia, slide EJvN 2828.

Diagnosis

T. silviae male lacks the typical yellow patch of other species of the *T. subnitidella* group, but can be relatively easily distinguished by a row of dark brown scales along the costal fold of the forewing and a similar row along the hindwing costa. The species is rela-

tively pale and small (wingspan ca 5.8-7.0 mm). It could be confused with a small specimen of *T. immundella* (Zeller), with *T. serotinella* Herrich-Schäffer or perhaps with a worn *T. cryptella* (Stainton), but all lack the brown scales and *cryptella* has a white hair-pencil on the hindwing. Females have a relatively



Fig. 4. Tenanted and vacated stemmines of *Trifurcula silviae* in *Onobrychis arenaria*; Foto Jari Junnilainen.

blunt abdominal tip, but are otherwise very similar to the forementioned species. The male genitalia (fig. 1) resemble those of *T. subnitidella* (Duponchel), but the gnathos (fig. 2) lacks the asymmetrical point and has a serrated margin. Male genitalia are hard to distinguish from *T. iberica* Van Nieuwerken, 1990 from Spain, which strongly differs in secondary sexual

characters of the male. Female genitalia (fig. 3) differ from *T. subnitidella* by the more truncated abdominal tip and more numerous setae on anal papillae. For more details see Van Nieuwerken (1990).

Biology

Host plants. – *Onobrychis arenaria* (Kit.) DC. and probably *O. montana* DC.

Life history. – Egg on the stem of the hostplant. The larva is about 5 mm long, yellowish. Mines can be found on different heights in the stem, from ground level to about 40 cm, occasionally with several mines occurring in the same stem. The mine (fig. 4) is a long gallery in the bark, typically with the larva first mining downwards, changing its direction a few times lengthwise. Total length of mine approximately 8–16 cm. The first 0.5–1.0 cm of the mine is very narrow (less than 0.5 mm wide), reddish brown. The remaining part of the mine is paler yellowish, with its width increasing to 2 mm. Frass not completely in centre, but often on the lateral edge of the mine, brown, quite well visible in the fresh mine.

Voltinism. – Larvae have been found in August, at the same time as old mines, indicating an earlier occurrence. Adults from June to August, possibly as one prolonged generation, but the existence of two generations cannot be excluded. Cocoon unknown. The life history of *T. silviae* resembles that of *T. subnitidella* (Duponchel).

Habitat. – Mountain pastures, dry calcareous or sandy hills, usually with low vegetation, occasionally with shrubs. In Spain on rocky limestone slope with *Onobrychis* sp., *Anthyllis vulneraria*, *A. montana*, *Astragalus monspessulanus*, *Hippocrepis comosa* and others. Altitude from 200 m to 2000 m. See fig. 5 for an impression of the Latvian habitat.



Fig. 5. Habitat of *Trifurcula silviae* in Šķaune area, with plants of *Onobrychis* in foreground. Foto Jari Junnilainen.

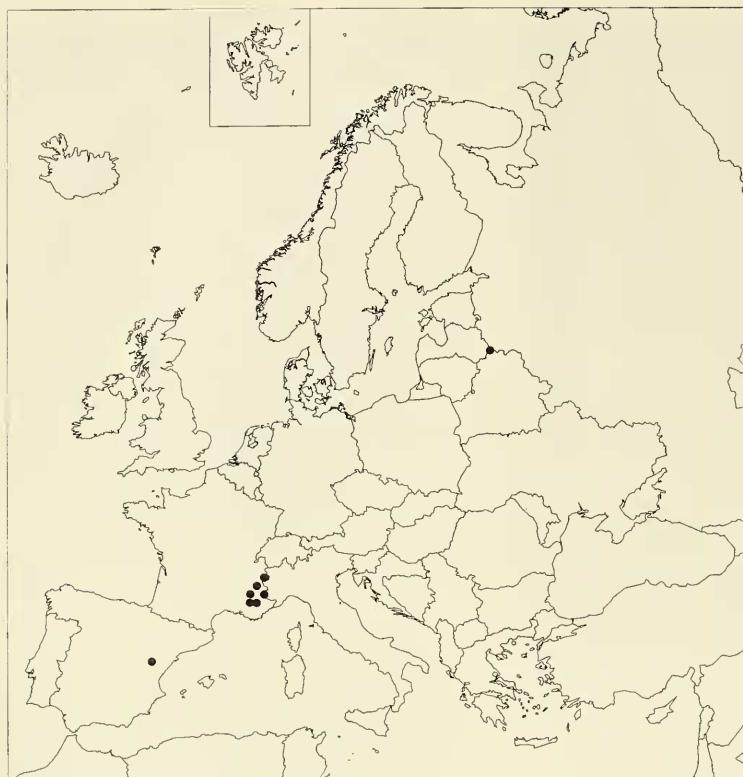


Fig. 6. Distribution of *Trifurcula silviae* in Europe, plotted on 50×50 km squares.

Distribution (fig. 6)

Spain, French and Italian Alps and Latvia. Most likely to occur in other localities, especially in the Alps and southern Europe, but possibly with disjunct distribution. See discussion.

Material examined (in addition to type series). — FRANCE: 1 ♂, 4 km N Eygians (Htes Alpes), 04.vii.1989–22.vii.1989, B. Å. Bengtsson (coll. Bengtsson); 1 ♂, Bessans: Col de la Madeleine (Savoie), 03.viii.1977, R. Buvat (coll. Buvat). — ITALY: 1 ♂, Mompantero, Mt. Rocciamelone (Piemonte), 1200 m, 18.vi.1993, G. Bassi (coll. Bassi). — LATVIA: 3 ♂, Šķaune (Šķkyane), 07.vi.1985, 29.vi.1986, N. V. Savenkov, sweeping over *Onobrychis arenaria* (coll. Savenkov), idem, 07.vi.1989, at light (coll. Šulcs); 1 ♂, 1 ♀, Šķaune, 14.vi.1994, flying over *Onobrychis arenaria*, K. Nupponen & J. Junnilainen (coll. Nupponen, Junnilainen); 2 ♂, Šķaune 9.vii.1994 by sweeping *Onobrychis arenaria*, K. Nupponen & J. Junnilainen (Colls. Nupponen, Junnilainen); mines and larvae, Šķaune, 18.viii.1994, adults emerging from 22.iii.1995 onwards, J. Junnilainen & I. Šulcs (RMNH, colls. Šulcs & Junnilainen). — SPAIN: 3 ♂, 1 ♀, prov. Teruel, Alcala de la Selva, 1400 m, 22.vi.1994, at light 1 h after sunset, A. & L. Laštívka.

DISCUSSION

The Šķaune locality, also known as the nature reserve Grebļakalns, is a sandy ridge, close to the village Šķaune in the extreme eastern part of Latvia, just a few kilometers from the Russian border. The ridge originated after the last glaciation, approximately 12 000 years BP. The length of the ridge is 6 km, rising 20–30 m above the surrounding plains. The slopes are covered with pine forest or mixed forest with many shrubs, such as *Euonymus*, *Cotoneaster* and *Corylus*. There are also open places, which are thought to have originated either as gravel pits or wood-burning places. The area has a continental and xerothermic microclimate and is known to be an outpost with relict elements of the Pontic flora and fauna, notably with plants such as *Onobrychis arenaria* (Kit.) DC., *Astragalus danicus* Retz. and *Dracocephalum ruyschiana* L. (see Šulcs 1975). These are thought to be relicts from the Subboreal period and occur in open places on slopes of the ridge.

Several Lepidoptera species in Latvia are known from this area only, such as *Heliothis kitti* (Schawerda). Several elements of the eastern European fau-

na occur here, such as *Cryphia ereptricula* (Treitschke), *Lacanobia splendens* (Hübner), *Cabera leptographa* Wehrli, *Stegania cararia* (Hübner) and *Udea costalis* (Eversmann) amongst others (Savenkov 1986, Šulcs 1973, 1975, 1976, 1978).

Most interesting, however, is a number of Lepidoptera associated with *Onobrychis arenaria*, and only known from this locality in Latvia: *Agrodiaetus damon* (Denis & Schiffermüller) (Šulcs 1964), *Zygaena carniolica* Scopoli forma *berolinensis* Staudinger (Savenkov 1986), *Cydia caecana* Schläger (Šulcs 1976), and now *Trifurcula silviae*. *O. arenaria* is a rare and very local plant in Latvia, included in the Latvian Red List. Most populations of this plant are adventive and occur in secondary habitats such as road verges and railways. Natural populations are scarce, and the present one is the largest. Despite thorough search for it, *A. damon* has been found nowhere else and should be regarded as confined to this locality. We may therefore assume that the occurrence of *T. silviae* is also extremely localized, and that its distribution in North-eastern Europe might also be rather disjunct, comparable to that of *A. damon*. In the Alps, however, we expect a much larger distribution of this species than known at present. Now its mines are known, it will probably be found more frequently.

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